<u>What Is Claimed Is:</u>

1. A node device for connecting a plurality of networks, said node device comprising:

5   a plurality of input units for respectively inputting data from first transmission lines installed in each of said plurality of networks;

           a plurality of output units for respectively outputting data to second transmission lines installed in

10 each of said plurality of networks; and

           a first switching unit for switching the data input from said input units to said output units;

           wherein the input unit that inputs data from a transmission line shared by said plurality of networks

15 among said first transmission lines has a higher transmission speed than other input units.

2. The node device according to claim 1, wherein at least one of said input units has transmission speeds that

20 differ from those of the other input units, and at least one of said output units has transmission speeds that differ from those of the other output units.

3. The node device according to claim 1, wherein the

25 output unit that outputs data to a transmission line shared by said plurality of networks among said second

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transmission lines has a higher transmission speed than
other output units.

4.   The node device according to claim 1, wherein
5 said plurality of networks uses bi-directional line
switching, and said node device further comprises:
        a memory unit for storing ring construction
information that indicates that said first transmission
lines and said second transmission lines connect to which
10 of said plurality of networks;
        a transmission unit for producing topology
information, squelch information and switching information
concerning each of said plurality of networks on the basis
of said ring construction information for each of the
15 corresponding networks, and transmitting said topology
information, said squelch information and said switching
information via said output units; and
        a second switching unit for performing processing
including switching operations and bridging operations on
20 the basis of said switching information.

5.   The node device according to claim 4, said node
device further comprising:
        a detection unit for detecting trouble in said
25 first transmission lines; and
        a judgment unit for judging whether or not
switching information is to be transmitted by said

transmission unit to all of the networks to which said

shared transmission line is connected, or to one of the

networks among said networks when said detection unit

detects trouble in said shared transmission line.

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6.   The node device according to claim 1, said node

device further comprising:

a multiplexing unit for multiplexing data by

using the digital wrapper method or OHBT method, and

10   sending this data to said output units when data is

switched and output to said output units from said input

units that have a transmission speed lower than that of

said output units.

15   7.   The node device according to claim 1, wherein

said input units input frame data that has been multiplexed

by using the digital wrapper method or OHBT method, and

said node device further comprises demultiplexing units for

demultiplexing said frame data input from said input units,

20   and sending this data to said output units that have a

lower transmission speed than said input units.

8.   The node device according to claim 1, wherein

said first and second transmission lines are formed by

25   optical fibers, and said data is transmitted and received

along said first and second transmission lines after being

multiplexed by time slots or by wavelength division

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multiplexing in which wavelengths correspond to said time slots.

9.   A network system comprising:

5   a first network in which a plurality of first node devices are connected by transmission lines;

            a second network in which a plurality of second node devices are connected by transmission lines; and

            a third node device which is connected to some of

10   the transmission lines of said first network and some of the transmission lines of said second network, said third node device transmitting and receiving the data transmitted and received by at least one of said transmission lines connected to said third node device at a higher speed than

15   the data transmitted and received by the other transmission lines of said first network and transmission lines of said second network.

10.   The network system according to claim 9, wherein

20   at least two of said third node devices are disposed adjacent to each other, and the data that is transmitted and received by said transmission lines between said at least two of said third nodes devices is transmitted and received at a higher speed than the data that is

25   transmitted and received by the other transmission lines of said first network and transmission lines of said second network.

11. An overhead information transmission method performed by a node device, said node device connecting a plurality of networks using bi-directional line switching

5 via transmission lines, said method comprising steps of:

storing ring construction information indicating that said transmission lines connected to said node device belong to which of said plurality of networks; and

transmitting topology information, squelch

10 information and switching information for each of said plurality of networks via said transmission lines in correspondence with said plurality of networks on the basis of said ring construction information.

15   12. A switching information transmission method performed by a node device, said node connecting a plurality of networks using bi-directional line switching via transmission lines, said method comprising steps of:

storing data which determines to send to which of

20 said plurality of networks switching information indicating that switching processing is to be performed when trouble occurs in a transmission line that input data into said node device among said transmission lines;

detecting trouble in the transmission line that

25 input data into said node device; and

sending said switching information indicating that switching processing is to be performed to the

corresponding network on the basis of said stored data when said trouble is detected.